

What is claimed is:

1. A toner for electrophotography comprising:

a binder resin;

a charge control agent; and

a colorant,

wherein the colorant is a black iron oxide compound containing from 10% by weight to 45% by weight of titanium component calculated in terms of Ti atom in relation to Fe atom when measured by wavelength dispersive X-ray fluorescence spectrometry, and

wherein peaks at Bragg angle 2θ of the toner to CuK α X-ray are peak A at 32.9 degrees \pm 0.3 degrees and peak B at 35.5 degrees \pm 0.3 degrees, and the intensity ratio of the CuK α X-ray between peaks A and B (A/B) is in the range of 0.3 to 2.0 at a scan speed of 0.5 degrees/min to 4 degrees/min.

2. A toner for electrophotography according to Claim 1, wherein the colorant is a black iron oxide compound containing from 12% by weight to 35% by weight of titanium component calculated in terms of Ti atom in relation to Fe atom when measured by wavelength dispersive X-ray fluorescence spectrometry.

3. A toner for electrophotography according to Claim 1,

wherein the intensity ratio of the CuK α X-ray between peaks A and B (A/B) is in the range of from 0.6 to 1.8.

4. A toner for electrophotography according to Claim 1, wherein the colorant has a saturation magnetization σ_s of from 0.5 emu/g to 30 emu/g.

5. A toner for electrophotography according to Claim 1, wherein the black iron oxide compound has an average primary particle size of from 0.05 μm to 2.0 μm .

6. A toner for electrophotography according to Claim 1, wherein the black iron oxide compound has at least one of a black dye, a black pigment, a blue dye and a blue pigment immobilized on the surface thereof.

7. A toner for electrophotography according to Claim 1, wherein the toner has the black iron oxide compound content of from 10 % by weight to 30 % by weight.

8. A toner for electrophotography according to Claim 7, wherein the toner has the black iron oxide compound content of from 15 % by weight to 25 % by weight.

9. A toner for electrophotography according to Claim 1,

wherein the binder resin comprises a resin (A) and a resin (B), having mutually different softening points,

the resin (A) and the resin (B) respectively have softening points $T_m(A)$ and $T_m(B)$, and glass transition points $T_g(A)$ and $T_g(B)$, satisfying the following relations:

$$T_m(A) > T_m(B);$$

$$|T_g(A) - T_g(B)| < 10\text{ }^{\circ}\text{C}; \text{ and}$$

$$30 \leq T_m(A) - T_m(B) \leq 60\text{ }^{\circ}\text{C}.$$

10. A toner for electrophotography according to Claim 9, wherein the softening points $T_m(A)$ and $T_m(B)$ and the glass transition points $T_g(A)$ and $T_g(B)$ satisfy the following relations:

$$|T_g(A) - T_g(B)| < 7\text{ }^{\circ}\text{C}; \text{ and}$$

$$35 \leq T_m(A) - T_m(B) \leq 55\text{ }^{\circ}\text{C}.$$

11. A toner for electrophotography according to Claim 1, wherein the binder resin comprises a polyester resin.

12. A toner for electrophotography according to Claim 1, wherein the charge control agent comprises a zirconium compound which comprises zirconium and one of aromatic hydroxycarboxylic acid and a salt thereof.

13. A toner for electrophotography according to Claim 1,

wherein the toner has a volume average particle size of 4 μm to 7.5 μm , and the toner has 60% by number to 80% by number of toner particles having a particle size of 5 μm or less.

14. An image fixing process comprising the step of:
passing a substrate bearing a toner image on the surface thereof between two rollers, one of the two rollers being a fixing roller that becomes in contact with the toner image-bearing surface of the substrate, to thereby fix the toner image on the substrate,

wherein the toner image is formed a toner which comprises a binder resin, a charge control agent, and a colorant,

the colorant is a black iron oxide compound containing from 10% by weight to 45% by weight of titanium component calculated in terms of Ti atom in relation to Fe atom when measured by wavelength dispersive X-ray fluorescence spectrometry; and

peaks at Bragg angle 2θ of the toner to $\text{CuK}\alpha$ X-ray are peak A at 32.9 degrees \pm 0.3 degrees and peak B at 35.5 degrees \pm 0.3 degrees, and the intensity ratio of the $\text{CuK}\alpha$ X-ray between peaks A and B (A/B) is in the range of 0.3 to 2.0 at a scan speed of 0.5 to 4 degrees/min, and
wherein the two rollers are applied with a bearing

force (load applied to the rollers/contact area) of 1.5×10^5 Pa or less, and the fixing roller has a thickness of 1.0 mm or less.

15. An image forming process comprising the steps of:
 - charging a photoconductor;
 - irradiating the photoconductor imagewise with light so as to form a latent electrostatic image thereon;
 - developing the latent electrostatic image using a toner so as to form a toner image;
 - transferring the toner image on the photoconductor to a substrate so as to bear the toner image on the surface of the substrate; and
 - passing the substrate bearing the toner image between two rollers, one of the two rollers being a fixing roller that becomes in contact with the toner image-bearing surface of the substrate, to thereby fix the toner image on the substrate,
- wherein the toner is a toner comprises a binder resin, a charge control agent, and a colorant,
- the colorant is a black iron oxide compound containing from 10% by weight to 45% by weight of titanium component calculated in terms of Ti atom in relation to Fe atom when measured by wavelength dispersive X-ray fluorescence spectrometry; and

peaks at Bragg angle 2θ of the toner to $\text{CuK}\alpha$ X-ray are peak A at 32.9 degrees \pm 0.3 degrees and peak B at 35.5 degrees \pm 0.3 degrees, and the intensity ratio of the $\text{CuK}\alpha$ X-ray between peaks A and B (A/B) is in the range of 0.3 to 2.0 at a scan speed of 0.5 to 4 degrees/min, and wherein the two rollers are applied with a bearing force (load applied to the rollers/contact area) of 1.5×10^5 Pa or less, and the fixing roller has a thickness of 1.0 mm or less.

16. An image forming process comprising the steps of contacting a charging member disposed in a charging unit with a photoconductor and applying a voltage to the charging member so as to charge the photoconductor;

irradiating the photoconductor imagewise with the light so as to form a latent electrostatic image thereon;

applying a toner to the photoconductor so as to develop the latent electrostatic image with forming a toner image;

transferring the toner image on the photoconductor to a substrate; and

heating and pressurizing the substrate bearing the toner image so as to fix the toner image on the substrate, wherein the toner is a toner which comprises a

binder resin, a charge control agent, and a colorant,

the colorant is a black iron oxide compound containing from 10% by weight to 45% by weight of titanium component calculated in terms of Ti atom in relation to Fe atom when measured by wavelength dispersive X-ray fluorescence spectrometry; and

peaks at Bragg angle 2θ of the toner to $\text{CuK}\alpha$ X-ray are peak A at $32.9^\circ \pm 0.3^\circ$ and peak B at $35.5^\circ \pm 0.3^\circ$, and the intensity ratio of the $\text{CuK}\alpha$ X-ray between peaks A and B (A/B) is in the range of 0.3 to 2.0 at a scan speed of 0.5 to 4 degrees/min.

17. An image forming apparatus comprising:

a photoconductor;

a charging unit configured to charge the photoconductor;

an irradiating unit configured to irradiate the charged photoconductor imagewise with light so as to form a latent electrostatic image on the photoconductor;

a developing unit housing a toner therein, configured to develop the latent electrostatic image using the toner so as to form a toner image;

a transferring unit configured to transfer the toner image on the photoconductor to a substrate; and

a fixing unit comprising two rollers, configured to

pass the substrate bearing the toner image between the two rollers so as to fix the toner image on the substrate,

wherein the toner is a toner which comprises a binder resin, a charge control agent, and a colorant,

the colorant is a black iron oxide compound containing from 10% by weight to 45% by weight of titanium component calculated in terms of Ti atom in relation to Fe atom when measured by wavelength dispersive X-ray fluorescence spectrometry; and

peaks at Bragg angle 2θ of the toner to $\text{CuK}\alpha$ X-ray are peak A at 32.9 degrees \pm 0.3 degrees and peak B at 35.5 degrees \pm 0.3 degrees, and the intensity ratio of the $\text{CuK}\alpha$ X-ray between peaks A and B (A/B) is in the range of 0.3 to 2.0 at a scan speed of 0.5 to 4 degrees/min, and

wherein the two rollers are applied with a bearing force (load applied to the rollers/contact area) of 1.5×10^5 Pa or less, one of the two rollers is a fixing roller has a thickness of 1.0 mm or less, and the fixing roller is subjected to a contact with the toner image bearing surface of the substrate when the substrate is passed through between the two rollers.

18. A process cartridge comprising:
a photoconductor; and
at least one unit selected from:

a charging unit configured to charge the photoconductor;

a developing unit housing a toner therein, configured to develop a latent electrostatic image formed on the photoconductor using the toner so as to form a toner image; and

a cleaning unit comprising a cleaning blade, configured to remove the residual toner on the photoconductor using the cleaning blade after the toner image is transferred from the photoconductor, so as to clean the photoconductor,

wherein the process cartridge is detachably mountable to a main body of an image forming apparatus, and

wherein the toner is a toner which comprises a binder resin, a charge control agent, and a colorant,

the colorant is a black iron oxide compound containing from 10% by weight to 45% by weight of titanium component calculated in terms of Ti atom in relation to Fe atom when measured by wavelength dispersive X-ray fluorescence spectrometry; and

peaks at Bragg angle 2θ of the toner to $\text{CuK}\alpha$ X-ray are peak A at $32.9^\circ \pm 0.3^\circ$ and peak B at $35.5^\circ \pm 0.3^\circ$, and the intensity ratio of the $\text{CuK}\alpha$ X-ray between peaks A and B (A/B) is in the range of 0.3 to 2.0 at a scan speed of 0.5 to 4 degrees/min.